Claims

1. A position measurement method, in which a position signal (POS, POS', POS") which represents a position measured by a position sensor is calculated from an input sine signal (SIN) and an input cosine signal (COS) produced by the position sensor, and with an output sine signal (SIN') and an output cosine signal (COS') each having a signal period ($f_{P"}$) which is a multiple of the frequency ($f_{P'}$) of the input signals (SIN, COS) being produced as a function of the position signal (POS, POS'. POS").

2. The method as claimed in claim 1, characterized in that the position signal (POS) is digitally filtered.

3. The method as claimed in claim 2, characterized in that a digital position signal (POS') is formed in the course of the filtering from the filtered position signal, with a resolution (k) which is higher than that of the calculated position signal (POS).

4. The method as claimed in one of the abovementioned claims, characterized in that the position signal is low-pass-filtered.

5. The method as claimed in one of the abovementioned claims, characterized in that the position signal is filtered by forming a sliding mean value.

6. The method as claimed in one of the abovementioned claims, characterized in that errors which are typical of the signal transmitter are filtered out of the position signal.

7. The method as claimed in claim 6, characterized in that the position signal (POS) is filtered by using stored error curves (ERR) which are dependent on the signal transmitter.

8. The method as claimed in one of the abovementioned claims, characterized in that the position signal (POS) is calculated from the arctan (*atan*) essentially of the quotient from the input sine signal (SIN) and the input cosine signal (COS).

9. The method as claimed in one of the abovementioned claims, characterized in that the input sine signal (SIN) and the input cosine signal (COS) are error-corrected before the calculation of the position signal (POS).

10. The method as claimed in claim 9, characterized in that different amplitudes of the input sine signal (SIN) and of the input cosine signal (COS) are compensated for in the error correction process.

11. The method as claimed in claim 9 or 10, characterized in that discrepancies between the offset in the input sine signal (SIN) and/or the input cosine signal (COS) and a nominal offset are regulated out during the error correction process.

12. The method as claimed in one of claims 9 to 11, characterized in that phase errors in the input sine signal (SIN) and/or in the input cosine signal (COS) are corrected during the error correction process.

13. The method as claimed in one of claims 9 to 12, characterized in that the correction values which are used to correct the errors in the input sine signal (SIN) and/or in the input cosine signal (COS) are calculated from the input sine signal (SIN) and/or from the input cosine signal (COS) themselves or itself.

14. The method as claimed in one of the abovementioned claims, characterized in that the position signal (POS, POS', POS") is produced in the form of an essentially

periodically varying, digital numerical value from k bits, from which a word element (m word) is read from m successive bits.

15. The method as claimed in claim 14, characterized in that the m word is used for addressing at least one output table (16a, 16b) in order to produce the output signals (SIN', COS').

16. The method as claimed in claim 14 or 15, characterized in that the position (k_m) of the m word within the k word is shifted by means of a read unit (15), in order to change the frequency of the output signals (SIN', COS').

17. The method as claimed in one of the abovementioned claims, characterized in that the frequency of the input signals (SIN, COS) is increased by an integer factor.

18. The method as claimed in one of the abovementioned claims, characterized in that the frequency of the input signals (SIN, COS) is increased by the factor 2^{k-km} in the output signals (SIN', COS').

19. The method as claimed in one of the abovementioned claims, characterized in that the output signals (SIN', COS') are read as a function of the position signal (POS, POS', POS") from at least one output table (16a, 16b) containing digitized values (*(0), ..., *(2^m-1)) of a sine function.

20. The method as claimed in one of claims 15 to 19, characterized in that two output tables (16a, 16b) are used, and are respectively associated with the output sine signal (SIN') and the output cosine signal (COS').

21. The method as claimed in one of the abovementioned claims, characterized in that the input signals (SIN,

COS) are produced from a position or angle measurement system (2).

22. The method as claimed in one of the abovementioned claims, characterized in that the quadrant position of a reference signal (REF) relative to the input signals (SIN, COS) is matched to the output signals (SIN', COS').

23. A position measurement system (1) for processing of signals (SIN, COS, REF) from a position sensor (1) with an input interface (21) to which an input sine signal (SIN) and an input cosine signal (COS) from a position sensor (7) can be supplied during operation, having a calculation unit (30) by means of which a digital position signal (POS, POS', POS") which represents a position measured by the position sensor, can be produced from the input sine signal (SIN) and the output cosine signal (COS), and having a signal generation unit (16), by means of which an output sine signal (SIN') and an output cosine signal (COS') can be produced as a function of the position signal (POS), respectively with a signal period which is a multiple of the input sine signal (SIN) and the input cosine signal (COS).

24. The apparatus as claimed in claim 23, characterized in that a register (14) is provided in which the *atan* value can be stored as a k word with a resolution of k *bits*, and an addressing unit is provided, by means of which an m word comprising m successive bits where $m < k$ can be read from the k word.

25. The apparatus as claimed in claim 23 or 24, characterized in that a signal conditioning device (23) is arranged between the calculation unit (30) and the input interface (21), by means of which the signal

errors in the input sine signal (SIN) can be corrected using the input cosine signal (COS).

26. The apparatus as claimed in one of claims 23 to 25, characterized in that a digital filter (13) is arranged between the calculation unit (30) and the register (14), by means of which errors which are dependent on the signal transmitter can be filtered out of the position signal (POS).

27. The apparatus as claimed in claim 26, characterized in that the digital filter (13) is essentially in the form of a low-pass filter.

28. The apparatus as claimed in claim 26 or 27, characterized in that the position signal (POS) has a resolution of i bits upstream of the digital filter, and has a resolution of k bits downstream from the digital filter, where $k > i$.

29. The apparatus as claimed in one of claims 23 to 27, characterized in that the apparatus has a position measurement means (2), by means of which the input signals (SIN, COS) can be produced as signals which represent the movement of a measurement means (4).